crispprd 1.0

Abstract

Back to Hit List

Grant Number: 1F31NR007844-01
PI Name: CARNO, MARGARET-ANN
PI Title:
Project Title: Impact of Changes in Circadian Rhythms in Pediatrics ICU

Abstract: *In critically ill children, therapeutic paralysis and sedation may be used for a week or longer in effort to decrease metabolic demand and improve synchrony with the mechanical ventilator. During this time the child is immobile and unable to respond physically to auditory, verbal or tactile stimuli. In addition to these factors that limit input necessary to maintain normal circadian rhythms, other disruptions occur because of the intensive care unit (ICU) environment. Because total sleep time is longer in children compared to adults the impact of sleep disruption may be particularly severe in this population. The purpose of this study is to examine changes in circadian rhythms and immune function in critically ill children who receive therapeutic paralysis and sedation and an age- matched comparison group admitted to the same ICU who do not receive this therapy. The study will use a prospective, repeated measures design. Subjects will be 10 children 1-3 years of age who undergo therapeutic paralysis and sedation following elective surgical reconstruction (laryngealtrachealplasty [LTP]) and 5 age-matched children admitted to the same ICU for a tracheal procedure who do not receive therapeutic paralysis. Study variables will be: 1) sleep stages over a continuous 4- day (96 hr) period, 2) core body temperature, melatonin and cortisol secretion over the same time period, and 3) immune function (IL-1beta, IL-4, monocyte function, TNF-alpha) at 2 time points (Day 1 & Day 4). Patterns of sleep stages (nonrapid eye movement (NREM) stages 1,2,3,4) will be examined for both groups. Children undergoing therapeutic paralysis and sedation will be monitored for the rest of the study variables. Statistical analysis will include descriptive statistics, cosinor analysis, and t-tests. The study is envisioned as the first step in a program of research designed to increase understanding of alterations in these measures during critical illness and develop interventions to maximize the*

restorative functions of sleep in critically ill pediatric patients.

Thesaurus Terms:
circadian rhythm, homeostasis, immunoregulation, intensive care, neuromuscular blocking agent, paralysis, pediatrics, sensory depression, sleep
body temperature, cortisol, iatrogenic disease, lighting, melatonin, sleep deprivation
blood test, clinical research, electroencephalography, enzyme linked immunosorbent assay, human subject, polysomnography, predoctoral investigator, preschool child (1-5), statistics /biometry, urinalysis

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Fiscal Year:	2001
Department:	NONE
Project Start:	01-SEP-2001
Project End:	
ICD:	NATIONAL INSTITUTE OF NURSING RESEARCH
IRG:	NRRC